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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,613	05/18/2004	Timo Schirmer	GEMS8081.215	3612
27061	7590	12/21/2005	EXAMINER	
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (GEMS)			FETZNER, TIFFANY A	
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MEQUON, WI 53097			ART UNIT	PAPER NUMBER
			2859	
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Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	Application No. 10/709,613	Applicant(s) SCHIRMER, TIMO	
	Examiner Tiffany A. Fetzner	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 19 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED Final ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-20 are Finally** rejected under **35 U.S.C. 102(e)** as being anticipated by **Frigo et al.**, US patent 6,891,371 B1 issued May 10<sup>th</sup> 2005, filed July 9<sup>th</sup> 2003. [Note the citations bolded below, are provided to address applicant's arguments of 10/19/2005 and specifically explained in the response to arguments section, which follows the rejections below.]

3. With respect to **Claim 1, Frigo et al.**, teaches and shows "A method of MR spectroscopy (MRS)" [See abstract] "comprising the steps of: acquiring a reference signal with a body coil"; [See **RF body coil 56** of figure 1, col. 5 line 30 through col. 6 line 67; col. 2 lines 1-15; col. 2 line 41 through col. 3 line 5; **See also col. 4 lines 31-47; col. 5 lines 4-9; figure 2, and col. 9 line 40 through col. 10 line 18 as noted in the response to arguments section** which follows these rejections]

4. **Frigo et al.**, also teaches and shows "acquiring metabolite signals with a plurality of receive coils;" [See col. 1 lines 7-11; col. 1 lines 53-67; col. 2 lines 42 through col. 3 line 16; col. 5 line 4 through col. 7 line 42.] "combining the metabolite signals to form a single MRS spectrum;" [See figure 2 col. 7 lines 1-42; and col. 1 line 7 through col. 11 line 47, since this limitation is a main teaching of the entire reference.] "and scaling the single MRS spectrum as a function of intensity of the reference signal. [See col. 5 line 30 through col. 11 line 47 where component  $a_{scale}$  is a constant scaling factor representing the ratio of the largest magnitudes of frequency components, and is drawn from the reference data]

5. With respect to **Claim 2, Frigo et al.**, teaches that “the step of acquiring the reference signal includes the step of acquiring signal from unsuppressed (i.e. non-suppressed) water with a uniform  $B_1$  body coil.” [See whole-body RF coil 56; col. 5 line 30 through col. 6 line 6] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

6. With respect to **Claim 3, Frigo et al.**, teaches and shows that “the plurality of coils is” a “phased array coil arrangement.” [See figure 1, array processor component 68 (i.e. this component processes input from the multiple reception coils (i.e. the multi-coil array) of the **Frigo et al.**, reference; See Figure 2 which shows multiple receivers combined as a single unit feature 132; col. 6 lines 7-67 where the number of receiver coils from which signals are acquired is “L” and the phase corrections, weightings scalings, and normalizations whose application to the received signal data result in the multiple receiver coil array intrinsically being a “phased array coil arrangement.” [See figures 1, 2, col. 4 line 29 through col. 11 line 47; col. 1 line 7 through col. 3 line 16; and the abstract which teaches “multi-coil” (i.e., a coil array), “multi-channel” (i.e. each channel by definition has a different defined phase) “simultaneous acquisition” (i.e. parallel signal acquisition) which is also known as “parallel phased array” acquisition in the MRI/NMR/MRS art.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 3** and need not be reiterated.

7. With respect to **Claim 4, Frigo et al.**, teaches and shows a “step of carrying out a pre-scan prior to acquisition of the reference signal.” [See figure 2 component 110, which occurs before step 114 where the reference data is acquired; col. 5 line 4 through col. 7 line 22] The same reasons for rejection, that apply to **claim 1** also apply to **claim 4** and need not be reiterated.

8. With respect to **Claim 5, Frigo et al.**, teaches “determining at least one of shimming, transmit frequency, receive coil gains, and transmitter gain from the pre-scan.” [See col. 5 lines 4-29; and col. 9 line 36 through col. 11 line 47; in combination with component 110 of figure 2.] The same reasons for rejection, that apply to **claims 1, 4** also apply to **claim 5** and need not be reiterated.

9. With respect to **Claim 6, Frigo et al.**, teaches and shows that “the step of scaling includes determining a ratio of reference signal amplitude to single MRS spectrum amplitude and modifying the single MRS spectrum by the ratio.” [See figure 2, col. 5 line 5 through col. 10 line 67; equations 1 through 26.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 6** and need not be reiterated.

10. With respect to **Claim 7, Frigo et al.**, teaches and shows “using a phased-array volume coil arrangement for a spectroscopy examination” [See the **rejection of claim 3**, which need not be reiterated] “in conjunction with an MR imaging examination.” [See the abstract, col. 2 line 41 through col. 3 line 16.] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 7** and need not be reiterated.

11. With respect to **Claim 8, Frigo et al.**, teaches and shows “An MRS apparatus comprising: a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MRS data, the RF coil assembly having phased array coils and a body coil; and a computer programmed to scale a composite signal of metabolite signals acquired with the phased array coils” [See the rejection of **claim 3**] “based on a reference signal acquired with the body coil.” [See figures 1 and 2; equations 1 through 26; the abstract; and the teachings of col. 1 line 7 through col. 11 line 47] The same reasons for rejection, that apply to **claims 1, 3** also apply to **claim 8** and need not be reiterated

12. With respect to **Claim 9, Frigo et al.**, teaches and shows that “the computer is further programmed to determine an intensity of the reference signal and an intensity of the composite signal, and determine an intensity ratio therefrom.” [See figures 2, 3, and 4; col. 3 lines 3-16; col. 3 line 44 through col. 11 line 17 where the ratios of the spectral peaks, which represent the intensity/amplitude/height of a specific metabolite are shown in 2D/3D] The same reasons for rejection, that apply to **claim 8** also apply to **claim 9** and need not be reiterated.

13. With respect to **Claim 10, Frigo et al.**, teaches and shows that “the computer is further programmed to modify the composite signal by the intensity ratio.” [See figure 2,



col. 5 line 4 through col. 11 line 47] The same reasons for rejection, that apply to **claims 8, 9** also apply to **claim 10** and need not be reiterated.

14. With respect to **Claim 11, Frigo et al.**, teaches and shows that “the computer is further programmed to scale the composite signal such that signal intensity of water as determined from MRS data acquired by the whole body coil equals signal intensity of water as determined from MRS data acquired by the phased array coils” [See the rejection of **claim 3**] and represented in the composite signal.” [See figures 1 through 4 in combination with the teachings of col. 5 line 4 through col. 11 line 47] The same reasons for rejection, that apply to **claims 1, 3, 8** also apply to **claim 11** and need not be reiterated.

15. With respect to **Claim 12, Frigo et al.**, teaches and shows that “the computer is further programmed to combine metabolite signals respectively acquired from each coil of the phased array coils” [See the rejection of **claim 3**] “to form the composite signal and combine the metabolite signals in an SNR increasing manner.” [See col. 5 line 52 through col. 6 line 6] The same reasons for rejection, that apply to **claims 1, 3, 8** also apply to **claim 12** and need not be reiterated.

16. With respect to **Claim 13, Frigo et al.**, teaches and shows that “the computer is further programmed to generate and display an MRS spectrum from the scaled composite signal.” [See figures 3, 4, in combination with figures 1 and 2; col. 4 lines 46-60; col. 9 line 36 through col. 11 line 47] The same reasons for rejection, that apply to **claim 8** also apply to **claim 13** and need not be reiterated.

17. With respect to **Claim 14, Frigo et al.**, teaches and shows with respect to Figure 4, that “the computer is further programmed to display the MRS spectrum for a single voxel of a VOI” (i.e. volume of interest) “from which the metabolite signals are acquired.” [See col. 1 lines 34-67; col. 7 lines 1-22 and figure 4 where the spectrum for a volume of interest, is shown for different voxels.] The same reasons for rejection, that apply to **claims 8, 13** also apply to **claim 14** and need not be reiterated.

18. With respect to **Claim 15, Frigo et al.**, teaches and shows “A computer readable storage medium having a computer program stored thereon to perform an MRS exam and representing a set of instructions that when executed by a computer causes the

computer to: acquire unsuppressed MRS water signal with a transmit and receiver coil; acquire MRS metabolite signals from a plurality of receive coils; combine the MRS metabolite signals to form an MRS composite spectrum; and scale the MRS composite spectrum to an intensity of the unsuppressed MRS water signal. [See figures 1 through 4; col. 3 line 11 through col. 11 line 47; and col. 2 line 41 through col. 3 line 10.] The same reasons for rejection, that apply to **claims 1, 8** also apply to **claim 15** and need not be reiterated.

19. With respect to **Claim 16, Frigo et al.**, teaches and shows that "the computer is caused to scale the MRS composite signal such that the amplitude of the MRS water signal equals the amplitude of a water signal in the MRS composite spectrum." [See figures 1 through 4; col. 3 line 11 through col. 11 line 47; and col. 2 line 41 through col. 3 line 10.] The same reasons for rejection, that apply to **claim 15** also apply to **claim 16** and need not be reiterated.

20. With respect to **Claim 17, Frigo et al.**, teaches and shows that "the plurality of coils is a phased-array volume coil arrangement." [See the rejection of figure 3, and the fact that imaging coils of figure 1 collect signal data from a three-dimensional volume.] The same reasons for rejection, that apply to **claims 1, 3, 8, 15** also apply to **claim 17** and need not be reiterated.

21. With respect to **Claim 18, Frigo et al.**, teaches and shows that "the computer is further caused to carry out a pre-scan prior to acquisition of the reference signal." [See figure 2 component 110, which occurs before step 114 where the reference data is acquired; col. 5 line 4 through col. 7 line 22] The same reasons for rejection, that apply to **claims 1, 4, 8, 15** also apply to **claim 18** and need not be reiterated.

22. With respect to **Claim 19, Frigo et al.**, teaches and shows that "the computer is further caused to determine at least one of shimming, transmit frequency, receiver gain, and transmitter gain from the pre-scan." [See col. 5 lines 4-29; and col. 9 line 36 through col. 11 line 47; in combination with component 110 of figure 2.] The same reasons for rejection, that apply to **claims 1, 5, 8, 15** also apply to **claim 19** and need not be reiterated.

23. With respect to **Claim 20, Frigo et al.**, teaches and shows that “the computer is further caused to acquire data of a spectroscopy examination using a phased-array volume coil arrangement” [See the rejections of claims 3, and 17 above which need not be reiterated] “in conjunction with an MR imaging examination.” [See the abstract, col. 2 line 41 through col. 3 line 16.] The same reasons for rejection, that apply to **claims 1, 7, 8,15** also apply to **claim 20** and need not be reiterated.

### ***Response to Arguments***

24. Applicant's arguments filed October 19<sup>th</sup> 2005 have been fully considered but they are not persuasive.

25. Applicant argues on page 5 of the October 19<sup>th</sup> 2005 amendment and response that **Frigo et al.**, fails to teach “a method as well as a system for acquiring a reference signal with a body coil” [See page 5 paragraph 2 sentence 1 of the October 19<sup>th</sup> 2005 remarks as well as paragraphs 3, 4, and 5 on page 5 of the remarks which concerns applicant's piece meal argument for why applicant believes this feature is lacked by the **Frigo et al.**, reference] The examiner notes that applicant is not seeing the teachings of the reference as a whole, with respect to the limitation of “a method as well as a system for acquiring a reference signal with a body coil”.

26. Specifically, **Frigo et al.**, teaches and discloses a body coil, (i.e. figure 1 component 56 taught specifically in col. 4 lines 31, 33, 41, 43 and line 46), which is utilized in either transmit/receive mode via switch 62; or additionally RF body coil 56 and switch 62 may be used with a separate RF coil (i.e. such as a surface coil) in **either** the transmit mode, **or** the receive mode as specified in col. 4 lines 31-48; because switch 62 is taught to be capable of also enabling (i.e. without removing RF body coil 56 from the system) ‘a separate RF coil (for example, a surface coil) to be used in **either** the transmit **or** receive mode”. [See col.. 4 lines 44-45] The examiner notes that because switch 62 controls the operation of transmission and / or reception for at least RF whole-body coil 56, as well as potentially the separate RF coil which is exemplified as a surface coil, there is at least one or more RF coils operating in **Frigo et al.**, device capable of transmitting, receiving or performing both the transmission and reception of MR signals. Additionally, in the case where the switch 62 is controlling only one RF coil,



the examiner is interpreting the coil being controlled by switch 62 as being the whole body RF coil 56. This teaching is important because it shows that a plurality of RF coils are capable of receiving, transmitting, or transceiving (i.e. transmitting and receiving) NMR MRS signals from a volume of interest of a patient being examined. Figure 2 also shows a receiver with multiple channels for signal reception.

27. **Frigo et al.**, teaches that method wise RF coil 56 (i.e. RF whole body coil 56) picks up (i.e. receives) the MR signals emitted from the excited nuclei of the patient, and that these signals are digitized by the transceiver module (i.e. transmit/receive module) 58. [See col. 4 lines 46-47].

28. In col. 5 lines 4-9 **Frigo et al.**, teaches and discloses the simultaneous acquisition of data for a 1D or 2D absorption spectrum plot from multiple receiver channels of an MR system. (i.e. the whole body RF coil 56 and the separate RF surface coil are examples of two different receive channels, of a multi-channel receiver). The MRS scan is taught to include a reference data acquisition in which a signal is acquired from a region or volume of interest. The examiner notes that while this teaching does not specify which specific RF coil (i.e. the whole body RF coil 56, or the separate RF surface coil), is acquiring the reference signal data, it does state that a reference data acquisition is performed.

29. Subsequently **Frigo et al.**, teaches and discloses in col. 9 line 40 through col. 10 line 18, that **reference data for each receiving coil** (i.e. including RF whole body coil 56, and the separate RF surface coil, ... etc., ) is collected, weighted, averaged if necessary, and used to eliminate errors from the NMR acquired metabolite signals acquired with the plurality of receive coils. The examiner notes that because RF whole body coil 56 is functionally capable of receiving NMR MRS signals, RF body coil 56, and the separate RF surface coil, ... etc., are **each** considered to be included within the scope of **Frigo et al.**,’s receiving coils from which reference data are acquired **for each receiving coil**. Therefore applicant’s argument that the whole-body RF coil 56 of **Frigo et al.**, fails to be used in acquiring the reference signal data used in the **Frigo et al.**, reference does not make sense, since in **Frigo et al.**, **each of** the coils which are capable of receiving an NMR MRS signal are also used to acquire reference data.

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30. The applicant's argument with respect to **claim 15** also is **not persuasive** because the fact that **Frigo et al.**, teaches **transmit only, receive only, or transmit / receive** operation, as well as the ability to receive NMR MRS from multiple channels, simultaneously has already been addressed. [See **Frigo et al.**, col. 9 line 40 through col. 10 line 18; figure 2; col. 5 lines 5-9; col. 4 lines 31-47]. The argument applicant wishes to make is unclear, because applicant is restating what is already taught in the **Frigo et al.**, reference. The examiner is unsure what feature of claim 15, applicant believes to be not found within the **Frigo et al.**, reference.

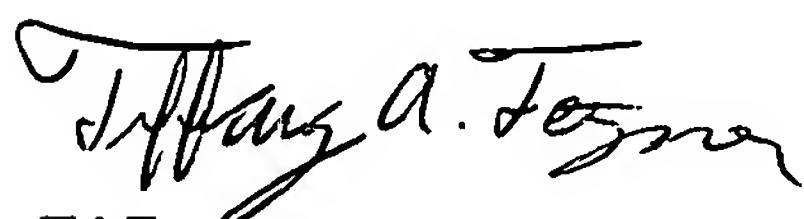
31. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

32. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

### Conclusion

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.



TAF

December 18, 2005



Diego Gutierrez  
Supervisory Patent Examiner  
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